

male individuals of *Pilostyles* grow so abundantly upon the branches of the *Adesmia* in Chili and on those of the *Astragalus* in the east, the female plant still remains unknown; there is here a gap to be filled up, in order to complete the description of this curious genus. Perhaps, according to Dr. Müller, the ring of papillæ surmounting that of anthers in both species may represent a row of aborted ovaries, as would seem to be indicated by a certain analogy of position with the flowers of the Aroideæ.

Here we have, therefore, an oriental and alpine species, *Pilostyles Haussknechtii*, coming to complete a genus hitherto known only from South America, and of which all the species, singularly enough, are parasitic upon shrubs of the family Leguminosæ. Hitherto we did not know, either in Europe or in Asia Minor, any Rhizanth,—the *Cytinus*, another plant parasitic upon the roots of the *Cisti* in the Mediterranean region, being arranged in a neighbouring family on account of its stem (which bears several monœcious flowers), its bilocular anthers, and other important characters.

It would have been easy for me to enlarge this list of *disjointed* species—that is to say, species growing in a botanical region very distant from that in which the rest of their genus or family live; but, without going in search of other little-known examples of this curious fact in botanical geography, we are acquainted with some which surprise us the less because we have them always under our eyes. Is it not singular, for example, that we find in the floras of Southern Europe only a single Myrtle and a single Laurel, whilst all the rest of the very numerous families to which these shrubs belong inhabit the tropical or subtropical countries of both continents? If, however, we consider that in the Tertiary period the Myrtles and Laurels were diffused in Central Europe, we get a glimpse of an explanation, being led, as has been so well shown by M. Alph. Decandolle in his 'Géographie Botanique,' to assume species of different antiquities, and to hope that, as our knowledge of the floras of preceding geological epochs becomes more complete, it will by degrees make us better understand the present distribution of plants.

BIBLIOGRAPHICAL NOTICE.

The Geology and Scenery of the North of Scotland; being Two Lectures given at the Philosophical Institution, Edinburgh. With Notes and an Appendix. By JAMES NICOL, F.R.S.E., F.G.S., &c. 12mo. Edinburgh, 1866.

PROFESSOR NICOL has three chief objects in these Lectures,—first, to elucidate the close and very evident connexion of the geological

structure and geographical features of his native country ; secondly, to claim his share of credit for early and long-continued labour in working out the geology of Scotland ; and thirdly, once more to protest against the now very generally accepted interpretation of the complicated phenomena of granites, schists, limestones, quartzites, and other altered rocks in the north-west Highlands, as elaborated by Murchison and Geikie, Harkness, Ramsay, and others. We must leave the disputed point, as to whether there be one (Nicol) or two sets of gneissose rocks in the Highlands, to the personal observation of working geologists, who for years to come will have to tramp over moss and moor many a weary day before all the details of stratification are connd and noted, and before what belongs to Lower and what to Upper Silurian is rightly determined in those wild regions. Nor can we be historians of the progress of geological knowledge in Scotland. The part that Prof. Nicol has so worthily performed can be readily known by reference to the publications quoted (and almost the only ones quoted) in the little book before us. We can, however, assure our readers that we have had real pleasure in reading some very eloquent passages in Prof. Nicol's Lectures, which are clear, earnest, and conscientiously true to the author's hard-won experience. Excepting that so many equally well informed geologists interpret the natural sections of the strata otherwise than he does, his view, of the great gneissic area being fissured from N.E. to S.W., with an alteration of level, might well command belief as being quite in accordance with the general structure of the region, where the edges of the strata run S.W.-N.E., partly from longitudinal folds, partly from great faults, holding the same direction and intersected by transverse fissures, breaking the land into large irregular masses. "These lines of elevation and of fraction have determined the lines along which rivers and other denuding agents have acted ; and consequently the systems of mountain-chains and river-valleys." The action of ice in this disintegration of the surface is little alluded to ; but the student can turn to Geikie's account of the Scottish scenery for an enthusiastic treatment of its effects. Our author, among his other "conservative" tendencies, ignores the hypothesis that refers many lake-basins to ice-action, which, he says, "may somewhat widen or deepen a valley, but not excavate a lake below its level. There is, however," he adds, "no mystery in the formation of lakes. Like the valleys in which they lie, they have been produced in more ways than one. Some have originated in great slips, —masses of the strata being thrown down, and the hollow then filled with water. Such is Loch Maree, as shown by the sandstone islands lying far below the gneiss hills on the shore. Many may have been excavated entirely by river-action—frequently, however, along the line of faults. The changes in the relative level of the different portions of the country explains the origin of very many. The western division, as the form and character of the coast prove, has subsided, gone down into the sea, since the eastern rose. By this change of level, valleys formerly dry and drained by rivers may have been converted into lakes. Their formation, therefore, requires no extraor-

dinary excavating action, but only, as is now happening in Scandinavia, that one portion of the land should rise or sink more rapidly than another. The absence of detritus in the west explains how the lakes once formed have long continued unfilled by river-washings." On the other hand, "a wide mud-filled sea-bottom, with icebergs floating and stranding in its shallow waters," was slowly lifted up on the eastern side of Scotland into a low undulating country, without such cliffs, and lochs, and inlets as mark the rugged western side.

The little conical holes or pipes in the old Silurian quartzite, or altered sandstone, of Assynt have their recent analogues in the burrows made by "small Crustacea on the Kyle of Duirness in sand washed out of these very rocks." Well may Mr. Nicol say, "yet the mind almost refuses to grasp the myriad ages that have intervened." Again, to quote our author, "Once the true history of the region is known and can be read off from a distance, there cannot be a more impressive lesson to the geologist than, from some lonely hill or moor in the Lewis, to trace the long line of strange fantastic mountains on the mainland, rising over the low gneiss platform on which they are built up. When we try to fathom the innumerable ages involved in these two steps in the history of the earth—and they are only two—the mind feels crushed with the interminable lapse of time, and is glad to seek repose in the view of the quiet ocean, with a few ships peacefully floating on its bosom. But it is only to be thrown back into the remote past. For was it not this ocean, these now invisible beating waves, that levelled that platform, fashioned and laid down these high masses of conglomerate, and moulded all these mighty mountains into form? And that, too, is a period dating, not centuries or millenniums, but world-ages, counted by birth and death, the creation and extinction of tribes and families of plants and animals, before man had a place on the earth!" Admirably, but from his own point of view alone, does Prof. Nicol sketch out the chief points in Scotland's primeval history; and some of its bearings on the living present are thus clearly indicated:—"To Scotsmen the structure of their own land should be specially interesting. We pride ourselves on being a peculiar people; and, were we willing to forget it, our neighbours are not slow to remind us of the fact. Now, be our peculiarities good or bad—virtues or vices—they have been in part produced, in part encouraged, by the character of the land in which we dwell. Like generous wine, they taste of the soil; they acquire new strength whenever they touch their mother earth. We rejoice in the skill and industry which have carried the rich culture of the Lothians far up the steep sides of the Lammermuirs and the Pentlands,—which have changed the skirts of Cairntable, where the Douglas defied the threats of England's proudest king, into fields of waving corn, and have converted the black wilds of Buchan, where the Bruce sought refuge in dire extremity, into storehouses of cattle and grain. Let me ask, What would this skill and industry have availed, had not the soil contained the elements of that fertility they were to draw forth? Look at the merchant princess of the west, and tell me if

Glasgow would have multiplied her people tenfold in a century, unless the great estuary of the Clyde had opened its bosom to fleets from many lands—unless she had possessed those stores of coal and iron that furnish the means and materials of her increasing labours. And our ancient metropolis in the east—were not the true foundations of Edinburgh then laid when internal fires pushed up through the level shales and sandstones that grand basaltic prism under whose protecting shadow first clustered the few rude huts which the toil and taste of her citizens have expanded into the stately streets and squares of modern Athens? And turning to a higher, less material product, is not the thought of the nation, its intellectual life, born of the soil, fed and nourished by the land in which we live? Is not the free exuberant poetry of Burns the genuine product of the banks and braes of Bonny Doon? Does not the romantic chivalry of Scott ever reflect Tweed's silver streams and Yarrow's dowie dens? And the dreamy ghost-like strains of Ossian, if they grew not up amid the grey rocks and mist-shrouded glens of Morven, were they not at least nursed under the gloomy shades of the pine-forests of Strath-Spey?

“There is not a more striking feature in the history of Scotland than the tenacity and success with which she maintained her national independence. Driven into a corner by her more powerful neighbour—cut off from retreat by barren hills and a stormy ocean, with much to lose by resistance, much to gain by yielding, she fought on for long centuries, and at length gave her king to her rival, and formed a free alliance with the freest nation in the world. How this was possible, a glance at the physical structure of the country will at once tell. But that structure is only the outward expression of internal geological phenomena. In the geological map the different formations are shown by colours. You will see how they run in lines across the country from shore to shore. Each band of colour marks a distinct formation. Some are igneous, others stratified. Some, hard and tenacious, naturally form mountains; others, softer and more yielding, valleys. Thus each geological formation became a true line of fortification. Every mountain-ridge was a wall; every valley a broad ditch, across which the southern invaders had to force their way. Usually they turned the flank of the first line of the Cheviots—came in by the east or west marches. But the second line of wall—the Southern Highlands, stretching from shore to shore, from St. Abb's Head to Stranraer—could not be so turned. Then, beyond, comes the wide ditch of the Firth of Forth, which no engineer had then ventured to bridge. North of it lies the third wall, of the Ochills, and the third river and Firth of the Tay. Deeper still rose the frowning barrier of the Grampians, backed by an interminable labyrinth of hills and glens, of winding straths, and fordless sea-lochs. No wonder the Roman eagles retreated from this region, and the conquerors of the ancient world fenced off its fierce tribes by walls and towers. Its peculiar character shutting out this mountain-land from all intercourse with other portions of the kingdom, gave it a people of its own, with special habits, traditions, and history.”